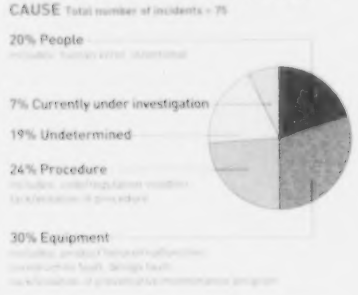
ELECTRICAL

HIGHLIGHTS

ELECTRICAL INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 75



INSPECTIONS IN 2005

BC Safety Authority Electrical Safety Officers completed nearly 50,000 inspections in 2005. In approximately 25 percent of these inspections (12,427 in total) Safety Officers found non-compliance[1] issues ranging from common code violations to unsafe operating conditions that led to immediate shutdown. Identifying non-compliance issues through our inspection process is an important part of maintaining safety in the electrical industry. This allows our Safety Officers to continually educate contractors about advancements in code requirements that, in turn, improves the overall quality and safety of work performed by these individuals. While the majority of inspections were performed on contractor and homeowner installations, our Safety Officers also performed inspections for product approvals, operating permits, hazards, surveys and temporary entertainment permits.

In 2005, there were 34,667 new housing starts reported in British Columbia. In a number of these new housing projects, the electrical installation was performed by a homeowner. Homeowner electrical installations are one of the greatest risks to public safety because they are generally performed by well-intentioned homeowners who are unlicensed and who do not regularly perform this type of work. As a result, the risk of an unsafe electrical installation occurring is much higher than when a BC Safety Authority-certified Field Safety Representative carries out or supervises the work. Hence, the BC Safety Authority inspects all homeowner installations.

For non-homeowner installation and operating permits, the BC Safety Authority relies on Field Safety Representatives to check completed work. In addition, we also use a risk-based safety assessment to send Electrical Safety Officers to inspect work performed under these permits and check that the declarations are true and complete.

INCIDENTS IN 2005

There were 75 electrical incidents reported to the BC Safety Authority in 2005. Fourteen of the 75 have an undetermined cause since a fire during the incident destroyed any evidence that would otherwise confirm whether or not electrical technology was a factor in the incident. At the time of publication, we are still investigating five incidents.

In total, there were six people injured (not including death) as a result of an electrical incident. Most of the six injuries were serious in nature, sustained directly by suffering burns from electrical shock, or indirectly as the result of a fire that occurred during the incident.

Two fatalities were recorded in separate incidents during the year. In both situations, workers were electrocuted when their materials came into contact with overhead power lines. Lead investigations into each of these incidents were headed by WorkSafeBC since both incidents were directly related to occupational health and safety.

[1] A **Non-Compliance** is a failure to comply with a required code or safety regulation.

ELECTRICAL

NON-COMPLIANCE IDENTIFIED THROUGH INSPECTIONS Total number of incidents = 49,878

ELECTRICAL

OUTCOME	TOTAL REPORTED INCIDENTS	HOUSEHOLD INCIDENTS	NON-HOUSEHOLD INCIDENTS	INCIDENTS PER 1,000 HOUSEHOLDS	INCIDENTS PER 1,000 HOUSEHOLD PERMITS	TOTAL NUMBER OF INJURIES AND FATALITIES
Death	2	1	1	0.09	0.19	2
Permanent Injury	2	0	2	0.00	0.37	2
Semi-Permanent Injury	0	0	0	0.00	0.00	1
Non-Permanent Injury	2	1	1	0.09	0.19	3
Near Miss[1]	69	41	28	3.88	5.22	0
Total	**75**	**43**	**32**	**4.06**	**5.97**	**8**

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

We released two Information Bulletins to the public in 2005: one pertaining to the qualifications of temporary Field Safety Representatives and the other relating to electrical hazards resulting from marijuana growing operations.

The BC Safety Authority actively consults with stakeholders and industry members on how to improve safety standards in British Columbia. This includes analyzing and adopting extensive changes to the electrical codes that are expected to be put in place in 2006. We also use our technical expertise to inspect regulated electrical products for compliance and potential public safety hazards.

Throughout the year, we have been making great efforts to improve both the quantity and quality of data collected in our system. While information collected in 2005 has begun to change the way we assess risks, one of our key priorities is to continue to monitor and evaluate our processes for improving safety for the Electrical Safety Program.

FUTURE OUTLOOK AND CHALLENGES

The use of electricity and electrical products continues to grow at a rapid pace. Electricity generated from alternative energy sources, such as wind, solar and geothermal, is quickly garnering more attention in the face of rising environmental concerns. Although alternative energy generation is still relatively limited in British Columbia, its rising demand has meant that investments and advancements in these technologies are steadily increasing. This presents a unique set of challenges to the BC Safety Authority and the electrical industry, as we try to maintain a good balance between safety and innovation.

Supporting our belief that individuals are responsible for the work they perform, we have seen strong growth and acceptance within the electrical industry of the Field Safety Representative concept. As we move forward, we realize that more investment, monitoring and enforcement are required to ensure that our vision of this model is realized.

One of the major challenges we face in the electrical industry is the hazard associated with counterfeit products. These products are generally of substandard quality and can be imported into the province with little regard to the safety hazard they pose to the general public. While the number of incidents caused by counterfeit products is low, the potential for serious injury and damage is very high.

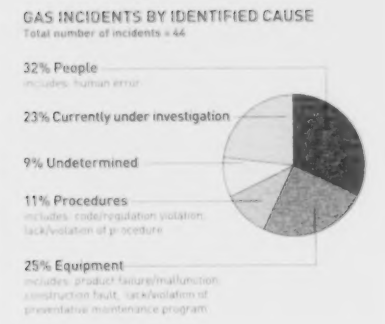
Another issue that has demanded an increasing level of attention is the adoption of codes and standards in British Columbia. Although the Canadian Electrical Code has been published on a four-year cycle, it will be published on a three-year cycle starting in 2006. This is a result of rapid changes in technology, pressure to harmonize with other jurisdictions and the movement towards objective-based standards. As we continue to move towards code and standards adoption, the role of our Electrical Technology Committee[2] and its numerous working groups will be vital in maintaining the integrity of the Electrical Safety Program.

[1] **Near Miss** is an incident where no actual harm resulted but the contributory causes are serious and under different circumstances they may have led to serious injury or death.

[2] **Technology Committee** is a non-decision-making body that has a primary role of identifying and advising the BC Safety Authority on public safety issues pertinent to the Authority's mandate.

GAS

HIGHLIGHTS


GAS INCIDENTS BY IDENTIFIED CAUSE
Total number of incidents = 44
32% People
includes: human error
23% Currently under investigation
9% Undetermined
11% Procedures
includes: code/regulation violation, lack/violation of procedure
25% Equipment
includes: product failure/malfunction, construction fault, lack/violation of preventative maintenance program

INSPECTIONS IN 2005

Our Gas Safety Officers completed over 20,500 inspections in 2005. With homeowner installations posing one of the greatest risks, we inspect all work done under homeowner installation permits. Since most homeowners are not qualified gas fitters, the work done must be inspected to ensure it complies with safety regulations. In contrast, we use a risk-based safety approach to inspect the work done by contractors.

The results show that 3,952 of the over 20,500 inspections (approximately 19 percent) identified at least one issue that was not compliant with current code regulations. Gas leaks discovered after an installation and improper storage of gas products were the two most serious non-compliance issues identified.

INCIDENTS IN 2005

Stakeholders reported 44 incidents to the BC Safety Authority in 2005. These incidents resulted in a total of 19 injuries and fatalities: three fatalities, nine serious injuries and seven non-serious injuries. At the time of publication, 10 of the 44 incidents were still under investigation by the BC Safety Authority.

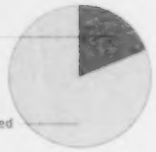
Among the reported incidents, two involved extensive property damage resulting from unqualified workers modifying gas installations. In one of these incidents, the occupants of the home escaped without injury. However, in the other incident, the two adults and two children residing in their recreational vehicle all sustained major injuries.

Two separate fatalities are suspected to have been caused by carbon monoxide poisoning; however, conclusions are tentative as investigations from the British Columbia Coroners Service are still ongoing. The third fatality was an infant who died from burns sustained in a propane barbeque fire.

In 2005, Terasen Gas also reported over 1,500 cases of gas lines being struck or punctured during ground digging. Fortunately, these incidents have not resulted in any death or major injury. We are currently addressing this issue in partnership with the British Columbia Common Ground Alliance, a not-for-profit organization that specializes in safety issues relating to underground infrastructure. The BC Safety Authority is in the process of analyzing these incidents for overall implications to the Gas Safety Program and we will share our results as they become available. However, since this special type of incident is primarily addressed by the BC Common Ground Alliance, it is treated separately from our current incident reporting structure and hence is not included in the incident figures reported earlier.

GAS

NON-COMPLIANCE IDENTIFIED THROUGH INSPECTIONS Total number of incidents = 29,648



GAS

Death	3	1	2	0.08	0.49	3
Permanent Injury	5	3	2	0.24	0.49	9
Semi-Permanent Injury	1	1	0	0.08	0.00	1
Non-Permanent Injury	5	4	1	0.32	0.24	6
Near Miss	30	17	13	1.38	3.16	0
Total	**44**	**26**	**18**	**2.10**	**4.38**	**19**

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

Natural gas and propane use is increasing in British Columbia. With more people using propane in vehicles, barbeques, camping stoves and heaters it is important that we make the public aware of the critical safety hazards associated with this gas. The potential for damage and injury relating to the use and mishandling of propane is considered critical and as such this issue will be managed by the BC Safety Authority. One way we have helped to protect the public is by educating them about these safety issues.

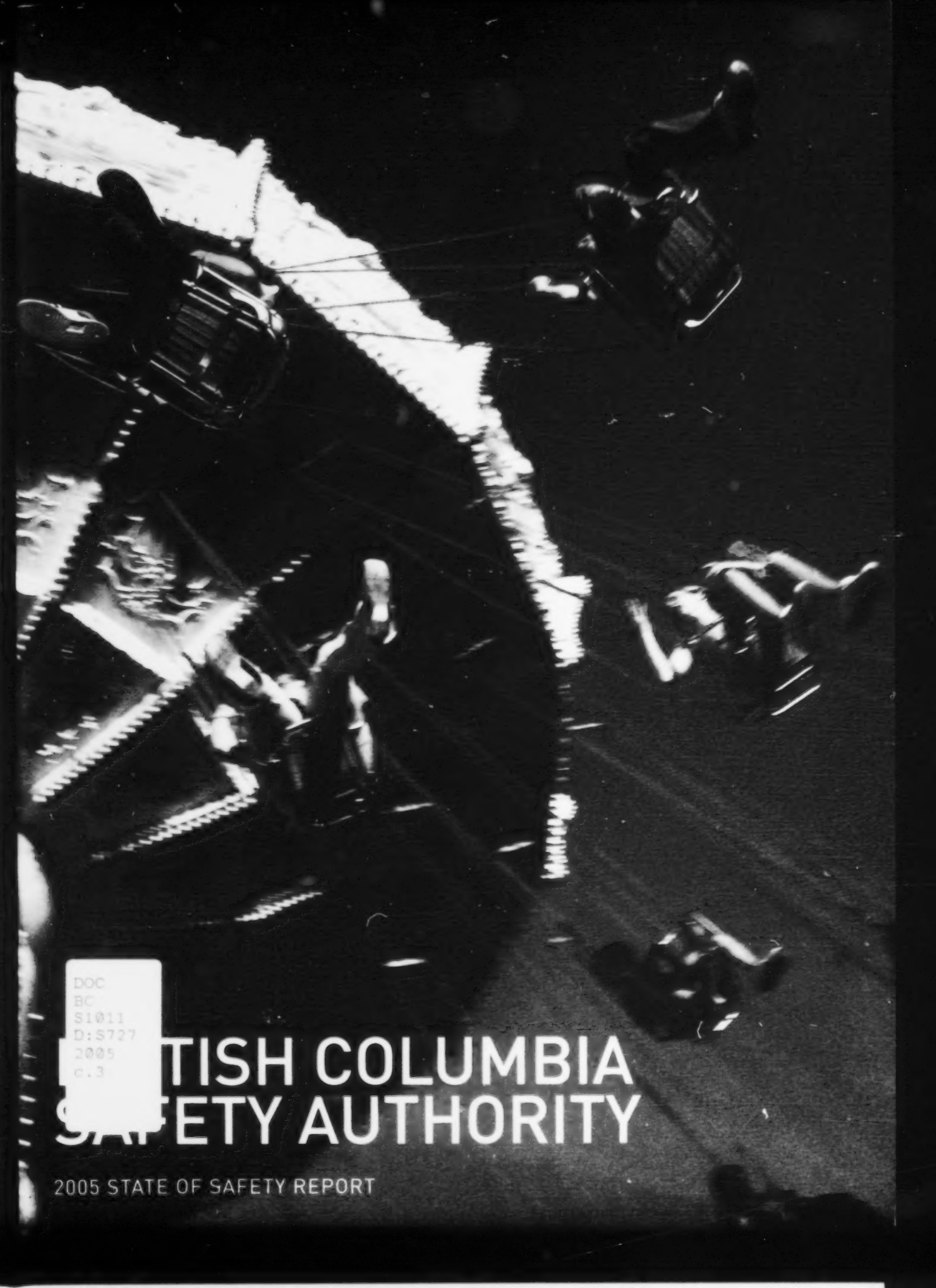
In 2005, we issued eight Information Bulletins on topics such as approved certification marks for gas appliances and guidelines for temporary propane installations and gas-fired pottery kilns. As well, the Provincial Safety Manager issued a Safety Order regarding the installation of gas appliances into solid fuel fireplaces.

To gain new knowledge from – and to share our own knowledge with – the gas industry, we consulted with various advisory committees on numerous occasions, as well as with industry groups at the national and international level. Through our team of design engineers, we also work with industry to identify potential safety issues on new products before they are introduced to the general public.

FUTURE OUTLOOK AND CHALLENGES

Although the number of reported incidents is steadily increasing, one of the challenges is determining whether the collected data represents the actual level of gas safety in the province. Reported incidents and near misses from first responders, including the fire department and police authorities, are currently underreported to the BC Safety Authority. While we will continue to work on improving incident reporting from each of these groups, until such improvement is seen, our ability to predict trends and issues relating to gas safety remains limited.

Similar to the trends seen in the electrical industry, another major challenge we face is the hazard associated with counterfeit and non-certified products. These products are generally of substandard quality and are imported into the province with little regard to the safety hazard they pose to the general public. While the number of incidents caused by counterfeit products is low, the potential for a serious injury and damage continues to increase as more of these products find their way into the province.



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2005 STATE OF SAFETY REPORT

BOILERS, PRESSURE VESSELS AND REFRIGERATION UNITS

HIGHLIGHTS

- More than 73,000 boilers and pressure vessels registered in 2005
- Performed over 11,000 inspections
- Signed our first Equivalent Standards Agreement in boiler technology with Chevron Canada

The Boiler and Pressure Vessel Safety Program ensures that new pressure equipment and operating boilers comply with the Safety Standards Act and the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation. Pressure equipment includes high and low pressure boilers, hot water boilers, refrigeration units, and fired and unfired pressure vessels. In addition to ensuring the safe operation of pressure equipment, we review new boiler and pressure vessel designs to make sure they meet safety code requirements.

During 2005, more than 73,000 boilers and pressure vessels were registered with the BC Safety Authority. Among these units, nearly 51,000 required an operating permit that was also issued by us.

In order to capitalize on safety experience and innovation within the industry, we signed our first Equivalent Standards Agreement in the boiler sector with Chevron Canada, one of the largest participants in the market. Under this agreement, both the BC Safety Authority and Chevron Canada benefit from reduced administrative costs and maintenance of current safety levels, and Chevron Canada is given the flexibility to innovate and improve on current safety standards. Equivalent Standards Agreements give more responsibility to individual operators to ensure safety, which is crucial to the growth of this industry.

INSPECTIONS IN 2005

In 2005 we inspected over 11,000 boilers, pressure vessels and refrigeration units. Our risk-based approach to safety allows us to identify those high-risk installations and operations that need periodic inspection services. While 190 units failed inspection, this number does not reflect the actual number of non-compliances found. In fact, most non-compliance issues that were identified resulted in the immediate shut down and maintenance of the unit. As such, the issue is corrected before the Safety Officer leaves the premises and the non-compliance is not recorded in the Certificate of Inspection[5]. For this reason, the number of non-compliances identified by our Safety Officers is higher than 190, but cannot be accurately reported beyond this figure.

Immediate action for safety issues regarding boilers and pressure vessels is necessary given the high potential for catastrophic damage and loss of life. Even though boiler and pressure vessel explosions are rare, we only need look back to 2004 to find an example of such an incident. In that case, a boiler housed in a separate building on the British Columbia Institute of Technology campus exploded because it was improperly operated and maintained. The explosion was so powerful that it destroyed the entire building and resulted in five injuries to people outside of the building.
In general, most identified non-compliances result from improper maintenance and failure to repair equipment. In these situations, our Safety Officers notify the owners to correct the non-compliance and generally perform additional inspections to ensure the non-compliances are corrected.

INCIDENTS IN 2005

We currently receive incident reports from power engineers, owners of regulated equipment and the media. These sources alerted our Safety Officers to seven incidents in 2005, with the only reported injury being non-permanent in nature. At the time of publication, one incident remained under investigation.

The leading cause of incidents involving boilers and pressure vessels was equipment failure caused by the absence of a preventive maintenance program. Four of the six completed incident investigations revealed that a lack of a preventive maintenance program was either a direct or contributing cause to the incident. In one of these cases, an air receiver mounted on an unregistered pressure vessel failed, resulting in minor injuries to the operator. In response to this incident, the Provincial Safety Manager issued a Safety Order requiring that all machine-mounted air receivers be tested weekly and subject to mandatory servicing every three years.

[4] An **Equivalent Standards Agreement** is an objective-based contract made between the BC Safety Authority and a regulated company. Under this agreement, the emphasis for safety is placed on what needs to be achieved, not how it is to be achieved.

[5] A **Certificate of Inspection** is a report completed by a Safety Officer to document the inspection of regulated work and/or product.

CORPORATE PROFILE

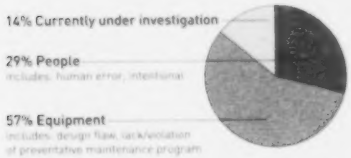
The British Columbia Safety Authority is an independent, not-for-profit corporation that protects the people of BC by overseeing the safety of mechanical systems, products, equipment and work practices. Whether we are certifying a gas fitter, issuing an operating permit for a new boiler or inspecting a homeowner's wiring, we are working to make our communities safer.

OUR SERVICES INCLUDE:

→ issuing permits;
→ inspecting technical work and equipment;
→ certifying individuals and licensing contractors to meet regulatory requirements;
→ educating the public about safety issues;
→ improving regulations for each industry sector we oversee;
→ investigating incidents to share the knowledge we gain; and
→ registering new equipment designs.

BOILERS, PRESSURE VESSELS AND REFRIGERATION UNITS

BOILER AND PRESSURE VESSEL INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 7


14% Currently under investigation
29% People
includes: human error, intentional
57% Equipment
includes: design flaw, lack/violation of preventative maintenance program

BOILER, PRESSURE VESSEL

OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 1,000 OPERATING PERMITS	TOTAL NUMBER OF INJURIES AND FATALITIES	INJURIES PER 1,000 OPERATING PERMITS
Death	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Semi-Permanent Injury	0	0.00	0	0.00
Non-Permanent Injury	1	0.02	1	0.02
Near Miss	6	0.12	0	0.00
Total	**7**	**0.14**	**1**	**0.02**

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

The 2004 explosion at the British Columbia Institute of Technology demonstrated the potential dangers of boilers and pressure vessels and served as a reminder that safety monitoring and preventive maintenance are vital to the safety of this industry. In 2005, we continued to refine our risk-based system to identify and inspect those installations that are deemed to possess a high level of risk to the public. However, in an industry that includes over 73,000 units, our ability to provide value-added safety services to the entire industry is limited by our own size and inspection capacity. To meet this challenge, we have invited the industry to work with us to meet and exceed safety standards. This has led to the identification of a number of potential Equivalent Standards Agreements with individual firms. In addition, with the support of our stakeholders, we continue to address key issues involving boilers and pressure vessels within our Technology Committee and our various ad-hoc issue groups[1] stemming from this committee.

As mentioned earlier, the Provincial Safety Manager issued one Safety Order pertaining to air receivers. This Safety Order was further processed by the Canadian Standards Association and issued as a national pressure vessel safety advisory. In addition, following an incident in June 2004, the BC Safety Authority issued a Safety Order requiring owners to conduct safety investigations of all firetube steam boilers for potentially hazardous defects involving cracking, corrosion and pitting. The BC Safety Authority also issued two Directives in 2005, one clarifying hydrogen regulation under the *Gas Safety Regulation* and *Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation* while the other dealt with calculating the maximum allowable working pressure of lap seam boilers.

FUTURE OUTLOOK AND CHALLENGES

Aside from an aging infrastructure, the demand for skilled trade workers has reached record levels, which in turn has led to a shortage of qualified power engineers in this province. This is especially true in rural areas that already face unique challenges in attracting, relocating and retaining workers. At this time, we are continuing to find ways to address this shortage. The BC Safety Authority is collaborating with other provincial and national organizations to harmonize regulatory requirements that would enable workers to move around the country. We are also continuing to work with industry to explore how technology can be used to address some of these challenges effectively. Technology used to supervise, monitor and control plant operations will not only help prevent incidents, but can also increase efficiency and overall safety through greater control and monitoring. This fundamental shift in technology has also allowed the BC Safety Authority and industry to explore new opportunities for power engineers to play a greater role in safety management.

[1] An **Ad Hoc Issue Group** is a small working group that makes recommendations on a particular issue to their designated Technology Committee.

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MESSAGE FROM THE PRESIDENT & CEO

CONFRONTING CHALLENGES AND MOVING FORWARD

IMPROVING DATA COLLECTION CHANNELS

To accurately identify current and future trends in safety, we need to use data that represents the actual level of safety in the province. We largely depend on external sources, such as stakeholders, emergency first responders and the public, to report incidents. However, not all incidents are consistently reported to us.

To increase the number of incidents reported to the BC Safety Authority, we are continuing to work with our industry stakeholders and we are developing a data sharing system with local governments and other safety organizations. I expect the number of incidents to increase rapidly over the coming years, and I welcome the new opportunities and changes that this data will bring. By receiving more reports on incidents, we will be able to improve our database and will be in a stronger position to report on safety trends and use the data meaningfully to minimize the potential for future incidents.

CONSIDERING ALTERNATIVE PERSPECTIVES

By partnering with a number of key authorities, I believe that we can develop a better understanding of all the factors that lead to incidents. During an investigation, for example, we may work with firefighters, police officers, coroners, insurance agents and technical experts. A single incident often produces a number of reports and recommendations. Together with these authorities, we identify new and existing areas where public safety improvements can be made.

MAINTAINING CONSISTENCY

Sustaining safety throughout the province requires consistency in both our decisions and our actions. In 2005, we developed Standard Operating Procedures to ensure consistency across each technology area and across the province. We also measure our consistency as an organization through decisions made by the Safety Standards Appeal Board, a government body that addresses concerns raised by our stakeholders. This process allows those affected by our decisions to address them in a fair and impartial manner. In 2005, the results of decisions made by the Appeal Board have been positive and upheld the decisions made by the BC Safety Authority.

As you can see, we are focusing our efforts on collecting comprehensive and accurate data and using this data meaningfully to address safety issues in the province. This is an ongoing process, requiring the development of both robust internal systems and strong partnerships with others. Our employees, as always, are central to our success in creating a comprehensive, consistent and effective safety system across the province. I thank them for their hard work in 2005.

Sincerely,

Harry Diemer
PRESIDENT & CEO

MESSAGE FROM THE CHAIR

At the end of our second year as an independent not-for-profit authority, we continue to improve on meeting our mission to protect the people of British Columbia by promoting and fostering safety in technical systems, products and equipment where they interface with the public.

We are guided by the values of transparency and accountability as we work to achieve this mission. Part of our responsibility for fostering safety in the province is to ensure that accurate and full information is shared with all citizens in British Columbia. This State of Safety Report is just one way that we are sharing information about our initiatives and our results.

Throughout the year we have continued to refine our methods and channels for data collection. While the data we collect is accurate, it is not reflective of the actual level of safety in this province. In this respect, we refrain from making annual comparisons. Our data collection is continuing to evolve, and with the support of our industry partners, we will build a world class safety system for this province.

The employees at the BC Safety Authority are, without doubt, our organization's greatest asset. On behalf of the Board of Directors, I extend our sincere appreciation for their ongoing efforts in making us better at what we do.

Sincerely,

John Watson
CHAIR

A STRATEGIC APPROACH TO IMPROVING SAFETY IN BC

IMPROVING SAFETY IN BC

MONITORING COMPLIANCE LEVELS

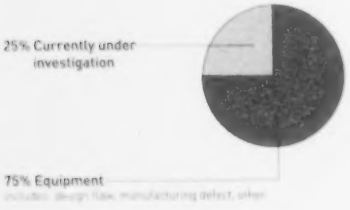
PROMOTING AWARENESS OF THE SAFETY SYSTEM AND PREVENTING INCIDENTS

DEVELOPING A COMPLIANCE MONITORING PROGRAM

AMUSEMENT RIDES

HIGHLIGHTS

AMUSEMENT RIDE INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 4



INSPECTIONS IN 2005

During the year, Safety Officers performed 203 amusement ride inspections and identified 134 non-compliance issues. The most common non-compliance identified in amusement rides was either the lack of a proper maintenance program or the improper assembly of small rides.

INCIDENTS IN 2005

The BC Safety Authority currently relies on amusement ride contractors and owners to report incidents. During 2005, four amusement ride incidents were reported, with two of these incidents occurring on roller coasters. One incident was caused when a roller coaster derailed due to an equipment malfunction, while the other occurred as a result of a manufacturing flaw. In each of these incidents, operator awareness and safety training were identified as major factors in preventing injuries to the general public.

There was one injury stemming from an amusement ride in 2005. In this incident, an adolescent rider received a mild shock from a broken light bulb. The ride's operator temporarily shut down the ride until proper corrective action was taken to address this issue.

At the time of publication, one incident remained under investigation by the BC Safety Authority.

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

Throughout the year, we continued to work closely with people in the amusement ride industry to ensure the safe operation and maintenance of its rides. As illustrated by the two roller coaster incidents, injuries to the public are often avoidable when proper training and procedures are in place. While our Safety Officers will continue to perform numerous tests and re-inspections, our strength in ensuring safety within the system is through stakeholder consultation. By analyzing previous incidents, we have found that working with individual amusement ride operators to encourage proper maintenance schedules and procedures has been the most effective way to prevent incidents from occurring in the future.

FUTURE OUTLOOK AND CHALLENGES

One of the main challenges in maintaining the amusement ride safety system is having owners and operators report all incidents to us. In fact, among the three completed incident investigations, all three incidents involved only one amusement ride operator. Primary responsibility for safety in the amusement ride industry is placed on the owners and operators of these rides, and as such, part of this responsibility includes reporting incidents for further safety analysis. For instance, one issue that we are closely monitoring is the hazard posed by inflatable amusement rides. These rides are coming under increased scrutiny by the BC Safety Authority following a number of recent fatalities in the United States.

THE STATE OF SAFETY REPORT

REPORTED INCIDENTS IN 2005
There were 431 incidents reported to the BC Safety Authority in 2005. While the data presented is conclusive, the comprehensiveness of incident reporting to the BC Safety Authority varies widely across each technology.

Electrical	75
Gas	44
Boilers, Pressure Vessels & Refrigeration Units	7
Elevating Devices	61
Passenger Ropeways	100
Amusement Rides	4
Recreational Railways	3
Railways	137

USING DATA FROM 2004

Since the BC Safety Authority began operations on April 1, 2004, the previous edition of the State of Safety Report covered only the first nine months of our operations. While the data collected during 2004 was important, it did not reflect the overall level of safety for the province. In fact, the number of incidents reported to the BC Safety Authority in 2004 is estimated to represent only a small fraction of the actual number of incidents that occurred during the year. Preliminary analysis of this data uncovered large discrepancies with regards to reporting from rural areas and the various data collection methods used in each of the technologies that we regulate. Moreover, safety data collected by our governmental predecessor prior to April 1, 2004 was not consistent with our current collection methodology, and hence could not be used in future analysis by the BC Safety Authority.

For these reasons, it is not possible to use incident data from 2004 to justify trends, identify outcomes and conduct comparisons with data collected in 2005. However, this does not suggest that the 2004 data is worthless. In fact, a number of the Safety Orders, Directives and Bulletins issued in 2005 resulted from the analysis and recommendations of incidents that occurred in 2004.

In 2005, we harmonized our data collection methods across the technologies we oversee and further instituted processes for future analysis and trending. By doing so, we have moved one step closer to ensuring that the trends we identify and the decisions we make are based on sound research and analysis.

RECREATIONAL RAILWAYS

HIGHLIGHTS

RECREATIONAL RAILWAY INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 3

INSPECTIONS IN 2005

In 2005, our Safety Officers performed 72 inspections across all 18 recreational railways. Each of the 18 recreational railway operations received three separate inspections relating to operations, mechanical and infrastructure safety from our Recreational Railway Safety Officer. In addition, the six recreational railways that use steam locomotives received an additional three inspections throughout the year from our Boiler Safety Officers.

From all the inspections performed in 2005, 44 non-compliances were cited by our Safety Officers. The majority of these non-compliances were mechanical in nature (23), while the fewest non-compliance issues were related to railway operations (nine). Our Safety Officers notify owners of all non-compliances directly. These owners are responsible for correcting all non-compliances and subsequently informing the Safety Officers of all corrections made.

INCIDENTS IN 2005

There were three incidents reported to the BC Safety Authority in 2005. While there were no injuries reported in any of these incidents, costs were incurred as a result of equipment and infrastructure damage. The average incident resulted in an estimated $4,500 in damage.

In one incident, a street tram collided with a motor vehicle after the automobile failed to stop and entered the oncoming path of the tram. While there was significant damage to both the automobile and the street tram, the actions of the street tram's conductor played a key role in preventing injuries in this incident.

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

Following this incident, we worked with the railway company and the local government to identify areas where safety improvements could be made at that particular crossing.

We also forwarded our recommendations to the organization that frequently uses that crossing, who in turn implemented safety procedures and guidelines for all staff members to follow when entering into the crossing.

We recognize that safety requires support from all levels, which is why we have partnered with the British Columbia Council of Heritage & Recreational Railways to ensure that all operators adhere to their required safety management plans. As this industry continues to grow, the value of our safety consultations, inspections and incident reporting system will become a vital resource in managing safety in this sector.

FUTURE OUTLOOK AND CHALLENGES

Traditionally, the recreational railway industry was dominated by hobbyists and train enthusiasts who had invested their own time and money to operate these trains. While the recreational railway industry is slowly continuing to grow and

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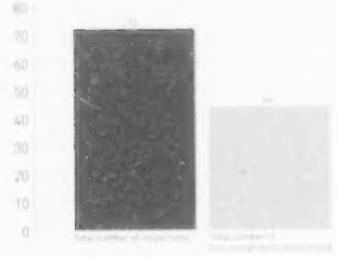
RECREATIONAL RAILWAYS

NUMBER OF RECREATIONAL RAILWAY INSPECTIONS RELATIVE TO NON-COMPLIANCE ISSUES IDENTIFIED

Average 0.61 non-compliances identified per inspection



RECREATIONAL RAILWAYS

Death	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Semi-Permanent Injury	0	0.00	0	0.00
Non-Permanent Injury	0	0.00	0	0.00
Near Miss	3	0.53	0	0.00
Total	**3**	**0.53**	**0**	**0.00**

evolve, the industry is faced with some of the same challenges it had in the past: under-investment in the system and the prevalence of volunteer workers. Financial investment in the system is a crucial part of maintaining safety within the recreational industry, hence the current level of under-investment in the system is seen as a threat to the overall safety of the industry. Furthermore, the widespread prevalence of volunteer workers also creates a unique situation as the industry must continually work towards retraining these volunteers to ensure that they are both aware of current safety regulations and are consistent in their approach to addressing safety concerns.

Prior to the establishment of the British Columbia Council of Heritage & Recreational Railways, the industry was made up of individual companies operating independently from one another. Common problems were experienced across the industry, but they were not effectively addressed or communicated.

Today, through the work of the Council, the industry is experiencing a fundamental shift in how individual companies communicate and cooperate with each other. Industry-wide knowledge and expertise is used to solve problems and address issues that would have otherwise remained isolated with the separate recreational railway operators. While significant progress has been made on many issues, the BC Safety Authority will work together with recreational railway operators to help sustain this industry for long-term growth and stability.

Some of the ways that the BC Safety Authority and the industry can provide a safe and fun ride for all passengers is by ensuring that infrastructure problems are addressed in a timely manner, upholding mechanical and engineering standards on all equipment, and constantly retraining staff on key safety operational procedures.

RAILWAYS

HIGHLIGHTS

Throughout 2005 the BCSA regulated four classes of railways:

1. Common Carrier: Group 1 (3 railway companies)
   - → Railways with moderate to large scale operations.
   - → Most similar to federally regulated railways.
2. Common Carrier: Group 2 (3 railway companies)
   - → Railways with small or limited operations.
   - → Generally operating on short-distance tracks.
3. Industrial (43 railway companies)
   - → Railways operating in an industrial setting.
4. Commuter (1 railway company)
   - → SkyTrain[2].

INSPECTIONS IN 2005

In 2005, Safety Officers cited 549 non-compliance issues across all four classes of railways. At the time of publication, the total number of inspections could not be summarized due to administrative constraints. Most of the non-compliances related to violations of Canadian Rail Operating Rules (227), while the remainder consisted mainly of violations in Track Safety Rules (189) and mechanical issues (82). In addition, Safety Officers also issued four company-specific "Notices" that were subsequently addressed by each of the identified railway companies. "Notices" are letters outlining specific violations with regard to the Act or Regulation and are issued when a Safety Officer believes that there is a potential threat to public safety that must be addressed.

INCIDENTS IN 2005

Incidents are reported and addressed in accordance with the BC Safety Authority's Railway Accident and Incident Reporting Requirements. Among the four classes of railways, there were 137 incidents reported to the BC Safety Authority. The majority of incidents (66) occurred within the SkyTrain commuter rail system, followed by 54 incidents reported by Common Carrier Group 1 railways and 14 by the industrial railways. In 62 of the 66 SkyTrain incidents, some passengers sustained minor non-serious injuries. Most of these injuries were a result of passengers tripping or falling while on the platform of a SkyTrain station or while in a train that was moving between stations. While SkyTrain had the largest number of reported incidents among the four classes of railways, the number of reported incidents was relatively low considering that it moved over 66 million passengers in 2005.

There were five fatalities recorded in 2005 for the regulated railway system. Subsequent investigations revealed that three of the five fatalities were not directly linked to the performance of the railway safety system, as these fatalities were classified as suicides. Two fatalities are currently under review by WorkSafeBC, the BC Safety Authority, and the British Columbia Coroners Service.

At the time of publication, one industrial railway incident from 2005 remained under investigation.

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

Throughout 2005, the BC Safety Authority continued to work with the railway industry to adopt the legislative changes made in 2004. In fact, with the assistance of our Safety Officers, all railway operations have complied with the *Railway Safety Act* and were issued operating permits.

[1] A **Safety Management System** is a formal framework that systematically sets out the railway company's rules, procedures and responsibilities with regards to safety.

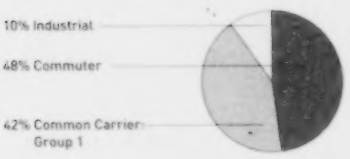
[2] In 2005, discussions were initiated with both the Canada Line and the Evergreen Light Rapid Transit (LRT) commuter rail operators. While both operations are still in the development and construction phases of their projects, each has applied to become a commuter railway in 2006.

RAILWAYS

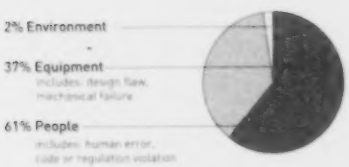
RAILWAYS

Common Carrier Group 1	57	2.75 per 100,000 car miles[1] or 1.71 per 100,000 car kilometres
Common Carrier Group 2	0	0 per 100,000 car miles[1] or 0 per 100,000 car kilometres
Industrial	14	6.72 per 100,000 cars handled[1]
Commuter	66	0.10 per 100,000 passengers carried[2] 0.17 per 100,000 car kilometres[1]

RAILWAY INCIDENTS BY CLASS
Total number of incidents = 137



COMMON CARRIER: GROUP 1 INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 57



One of the most important initiatives identified in 2005 was the need for railway employees to become more aware, understand and follow the Canadian Rail Operating Rules and their respective company's Safety Management System. As we move forward into 2006, this safety initiative will continue to be our main focus.

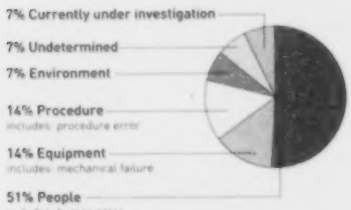
FUTURE OUTLOOK AND CHALLENGES

Historically, the railway system was the first major infrastructure project that connected the western provinces to the rest of Canada. In order to replicate its success on a provincial scale, investment in the provincial railway system was emphasized for its ability to connect resource-rich rural areas with more heavily populated urban areas. Today, the railway industry faces the challenge of maintaining and enhancing its extensive infrastructure.

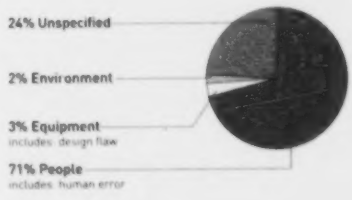
Since 1986, SkyTrain has been the primary commuter rail system in the province with tracks running either below ground or elevated above it. However, with one of the new commuter railway projects expected to run along the ground, there will be a period where motorists and pedestrians will need to adapt to this new type of mass rail transit. This presents a unique challenge to our Railway Safety Program as we work together with the industry to identify and develop effective public safety solutions.

Maintaining safety within a system this complex requires support from all levels of the public and private sectors. While the BC Safety Authority provides inspection, auditing and incident investigation services, the challenge for many railway companies is in tailoring their own programs to continually ensure the safety of their employees, their equipment and most importantly, the public.

INDUSTRIAL RAILWAY INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 14



COMMUTER RAILWAY INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 66



DEFINITIONS

Ad Hoc Issue Group: A small working group that will make recommendations on a particular issue to their designated Technology Committee.

Certificate of Inspection: A report completed by a Safety Officer to document the inspection of regulated work and/or product.

Directives: A document that clarifies interpretations of code or regulation requirements, provides direction concerning how a regulation will be applied, or serves as the instrument by which a Provincial Safety Manager exercises a power granted under the Safety Standards Act.

Equivalent Standards Agreement: An objective-based contract made between the BC Safety Authority and a regulated company. Under this agreement, the emphasis for safety is placed on what needs to be achieved, not how it is to be achieved.

Incident: An event occurring that either:

(a) causes death, personal injury or damage to property, or
(b) creates a risk of personal injury or damage to property.

Information Bulletins: Non-statutory and non-binding instruments that provide general information to employees, stakeholders and the public.

Inspection: A physical examination of work and products to see if they meet safety requirements.

Near Miss: An incident where no actual harm resulted but the contributory causes are serious and under different circumstances they may have led to serious injury or death.

Non-Compliance: A failure to comply with a required code or safety regulation.

Safety Management System: A formal framework that systematically sets out a railway company's rules, procedures and responsibilities with regards to safety.

Safety Orders: Binding instruments issued by Provincial Safety Managers to prevent, avoid or reduce the risk of personal injury or damage to property.

Technology Committee: Non-decision-making bodies that have a primary role of identifying and advising the BC Safety Authority on public safety issues pertinent to the Authority's mandate.

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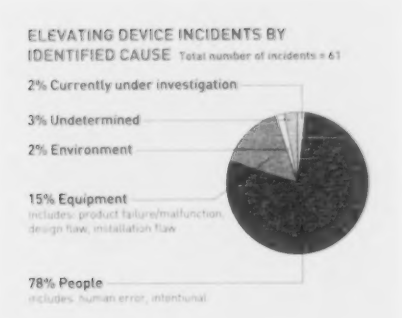
ELEVATING DEVICES

HIGHLIGHTS


ELEVATING DEVICE INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 61
2% Currently under investigation
3% Undetermined
2% Environment
15% Equipment
includes: product failure/malfunction, design flaw, installation flaw
78% People
includes: human error, intentional

INSPECTIONS IN 2005

In 2005, we conducted nearly 2,500 inspections on newly installed elevating devices. We make it a practice to inspect all newly installed elevating devices so that we can identify code violations prior to the unit being certified for operation. For units already installed, we use a risk-based approach to identify high-risk units for physical inspection. When our Safety Officers identify a non-compliance, they directly notify the owners of the regulated equipment. Owners, or contractors on behalf of owners, are then responsible for correcting all non-compliances and for informing our Safety Officers that corrections have been made.

On average, our Safety Officers identified 1.68 non-compliance issues (out of a total of 4,177 non-compliance issues) per inspection. By conducting a thorough multi-point inspection prior to the operation of an elevating device, we help to improve the overall quality of units that are constantly being installed throughout the province.

INCIDENTS IN 2005

Throughout 2005, our stakeholders reported 61 incidents, of which 53 resulted in injury or death, including one fatality, one serious injury and fifty-one non-serious injuries. At the time of publication, one incident involving a non-permanent injury remained under investigation by the BC Safety Authority.

Forty-one of the 61 incidents reported in the elevating devices technology area involved an escalator. In fact, 38 of the total injuries reported involved were minor injuries involving an escalator. The majority of escalator incidents resulted from an individual slipping or tripping. The next leading cause was from objects (carts, strollers and bikes) falling down escalators due in part to improper use.

Another 19 of the 61 total reported incidents involved an elevator. While most of these injuries involving an elevator were non-serious in nature, the two most serious incidents recorded in 2005 resulted from equipment failure of an elevator.

In one incident, a chain connecting an elevator's vertical car gate broke, causing the gate to fall and crush the patron's ankle. After an exhaustive investigation, the Provincial Safety Manager issued a Safety Order for all similar units to be reinforced with a safety device to ensure that failure of this nature would not result in a falling car gate.

During the year, a dumbwaiter fell on a worker, seriously injuring her and ultimately resulting in her death. Although the unit had been inspected, sealed and taken out of operations in 1996, the shutdown notice was subsequently violated and the unit was reactivated. The malfunctioning equipment was later found to have caused the worker's death.

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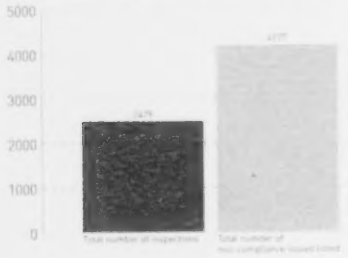
ELEVATING DEVICES

NUMBER OF ELEVATING DEVICE INSPECTIONS RELATIVE TO NON-COMPLIANCE ISSUES NOTED

Average 1.68 non-compliances identified per inspection



ELEVATING DEVICES

Death	1	0.05	1	0.05
Permanent	1	0.05	1	0.05
Semi-Permanent Injury	2	0.10	2	0.10
Non-Permanent Injury	48	2.45	49	2.50
Near Miss	9	0.46	0	0.00
Total	**61**	**3.11**	**53**	**2.70**

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

Events such as the dumbwaiter incident underline the importance of why the BC Safety Authority, its stakeholder groups and industry at large must work together to make safety a priority among all owners and operators. Following the dumbwaiter incident, the Provincial Safety Manager ordered that all similar units must be permanently removed from service. We also reviewed current shutdown procedures and re-evaluated the methods used to identify these high-risk situations.

Throughout the year, the BC Safety Authority technology committee consulted with the elevating devices industry and has been involved with industry organizations such as the Canadian Elevator Contractors Association and the Building Owners and Managers Association. We also participate in national and international technical standard committees to develop new standards that will allow new technology to be adopted and further reduce the cost of these products and services. Ultimately, this will allow newer and safer products to be installed in greater numbers.

In addition to the Safety Order issued during the year, the Provincial Safety Manager also released one Directive to all licensed elevating device contractors to submit a list that details the elevating devices that they currently have under mandatory maintenance contracts.

FUTURE OUTLOOK AND CHALLENGES

Until recently, there were few elevators installed in households, with most being installed only in luxury homes. However, more household elevators are being installed because of both lower prices and rising demand from an aging population. In fact, BC currently has more elderly citizens per capita than any other Canadian province. With more unregulated elevator installations occurring in households, the safety concerns for proper maintenance and installation are a key issue for our organization.

The largest safety concern we have with regard to household elevators is with units that are already installed. These units are being used more frequently by the elderly; however, they were not inspected for compliance with code. Although the BC Safety Authority currently does not regulate elevating devices installed in houses, we will continue to consult with the industry and monitor this trend over time, and if warranted, we will move towards more active participation in the future.

PASSENGER ROPEWAYS

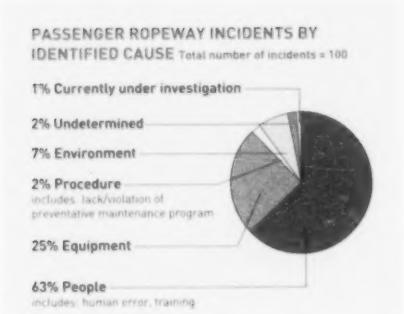
HIGHLIGHTS

- → 231 units installed in 48 locations throughout British Columbia
- → Strongest incident reporting and data collection methods in the BC Safety Authority
- → Established a new Passenger Ropeway technical committee to address industry-wide issues

The BC Safety Authority's Passenger Ropeways Safety Program oversees the safety of 231 passenger ropeway units in 48 different locations across the province. Examples of passenger ropeways include tramways, gondolas, chair lifts, T-bars, rope tows and conveyors. We inspect existing, new and modified units in accordance with the Safety Standards Act and the Elevating Devices Safety Regulation.

Today, the Passenger Ropeways Safety Program has developed one of the strongest incident reporting systems and data collection methods within the BC Safety Authority. As a result, the Passenger Ropeways Safety Program not only receives more reported incidents than any other technology we regulate, but also reports in greater detail the nature of non-compliances that are found during inspections. Among other factors, the success in this technology can be attributed to the high level of participation and cooperation between the BC Safety Authority and the owners and operators within the industry. In fact, compared to the relative size of this technology to others, the quantity and quality of the data being reported is significantly greater.

In reviewing the data presented, it is important to keep in mind that the majority of passenger ropeway installations are used during the winter months since most of the technology in this field is tailored for use in the ski and snowboard industry. While tramways, gondolas and chair lifts can be operated year round, the majority of these installations experience heavy traffic flow during the winter ski season, which lasts from October to April. Among the 100 incidents reported to us in 2005, only two occurred outside the ski and snowboard season.


PASSENGER ROPEWAY INCIDENTS BY IDENTIFIED CAUSE Total number of incidents = 100
1% Currently under investigation
2% Undetermined
7% Environment
2% Procedure
includes: lack/violation of preventative maintenance program
25% Equipment
63% People
includes: human error, training

INSPECTIONS IN 2005

In 2005, Safety Officers completed 167 passenger ropeway inspections across the province. On average, our Safety Officers identified five non-compliances (817 in total) for every inspection performed. Most of these cited non-compliances (176) were operational in nature.

INCIDENTS IN 2005

One hundred incidents were reported to the BC Safety Authority in 2005, with 24 resulting in personal injuries. Twenty-one of these injuries were less serious in nature, mostly involving sprains and minor lacerations incurred from falls during loading and unloading from a chair lift.

Three skiers sustained serious injuries while using a ski lift in 2005. Two of these injuries involved bone fractures, each sustained in separate incidents when passengers fell off a carrier along the lift line. The first incident was a result of a child who slipped and fell after raising the safety restraining bar. Similarly, the second incident, involving a teenage skier, was also the result of the safety restraining bar not being properly used by the passenger. The other serious injury was a back injury sustained when two passengers lost control on a T-bar and fell on top of another guest.

All of the incidents resulting in injuries were caused by human error. In fact, 63 percent of all incidents reported in 2005 were due to human error. While 25 reported incidents involved equipment failure of some nature, properly trained operators in these situations were able to identify an unsafe condition and subsequently prevented injuries by evacuating the ropeway until proper safety precautions could be taken.

At the time of publication, one reported incident remained under investigation.

PREVENTIVE ACTIONS TO IMPROVE PUBLIC SAFETY

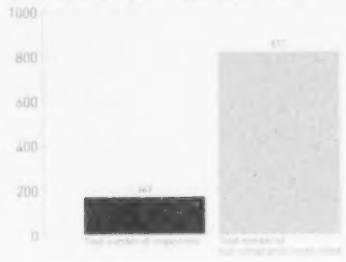
Following an incident in February 2005, the Provincial Safety Manager issued a Safety Order to all industry owners and operators regarding the set-up of a specific regulated product: Mueller deropement switches on combination or "Rosta" sheave assemblies. We required all contractors to immediately inspect similar installations to decrease the risk of serious injury to the public. Moreover, the manufacturer was also notified of the potential hazard so that it could take action and follow up with other installations outside of British Columbia.

Aside from issuing Safety Orders, we continue to work with the passenger ropeway industry to manage the safety of each and every rider. One way we have done this is by establishing a technical committee dedicated to identifying, reviewing and reporting on issues relating to this technology. Further insight, research and recommendations from this committee will contribute to the ongoing improvement of the Passenger Ropeways Safety System.

PASSENGER ROPEWAYS

NUMBER OF PASSENGER ROPEWAYS INSPECTIONS RELATIVE TO NON-COMPLIANCE ISSUES NOTED

Average 4.89 non-compliances identified per inspection



PASSENGER ROPEWAYS

OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 1000 OPERATING DAYS	TOTAL NUMBER OF INCIDENTS REQUIRING MEDICAL ATTENTION	INCIDENTS PER 1000 OPERATING DAYS
Death	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Semi-Permanent Injury	3	0.07	3	0.07
Non-Permanent Injury	21	0.47	21	0.47
Near Miss	76	1.69	0	0.00
Total	**100**	**2.23**	**24**	**0.54**

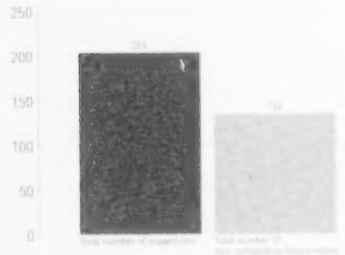
FUTURE OUTLOOK AND CHALLENGES

With BC hosting the upcoming 2010 Olympic and Paralympic Winter Games, there is increased attention from all levels of government and media on our local ski mountains, the types of technology installed at each venue and, more importantly, the safety record of each technology being used. We and our stakeholders within the passenger ropeway industry recognize that safety must always be considered, from the initial design and construction phase through to the operation and maintenance of this equipment. Consequently, one area that both the BC Safety Authority and industry are working to improve is the certification process for industry mechanics. As we move forward, the BC Safety Authority and industry will work together to ensure that standardized qualifications, training and experience become an essential component to maintaining the integrity and success of the Passenger Ropeways Safety Program.

AMUSEMENT RIDES

NUMBER OF AMUSEMENT RIDE INSPECTIONS RELATIVE TO NON-COMPLIANCE ISSUES NOTED

Average 0.66 non-compliances identified per inspection



AMUSEMENT RIDES

Death	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Semi-Permanent Injury	0	0.00	0	0.00
Non-Permanent Injury	1	0.23	1	0.23
Near Miss	3	0.70	0	0.00
Total	**4**	**0.93**	**1**	**0.23**

While there is a considerable gap between the industry and the BC Safety Authority regarding data collection and incident reporting, we realize that the best solution to this problem is to foster key relationships within the industry. Once we have done so, we can work together towards a method of incident reporting that will allow us to make progressive improvements to the amusement ride safety system and also benefit our stakeholders through the value-added services we can offer.

An ongoing issue that we are addressing in the amusement ride industry is the development of standards for new technology. In particular, with more ski hills and outdoor adventure destinations looking to install high velocity zip lines on their premises, we are taking an active role in identifying safety risks and developing standards for this emerging ride.